Chapter 5 ~~SR~~Safety and Maintenance

Safety and the related issue of maintenance are primary community concerns to ensure the roadway system's safety and longevity. This chapter provides an overview of the safety and maintenance issues for the City of Bainbridge Island. The core of the safety section is a discussion about accident history and high accident locations. The maintenance section describes maintenance issues, activities, and programs that occur on the Island.

Safety

Many of the Island's two-lane roads were constructed before current safety guidelines were developed. As traffic levels increase, the potential for safety concerns rises. There is a combination of factors that can lead to accidents on substandard roadways, including demographic changes to the Island's population, preferences for larger or more powerful vehicles, increased motor vehicle volumes, and demands for greater use of roadways by pedestrians and bicyclists. Crashes on these roads can have more serious consequences because of narrower lanes and shoulders, hazardous roadsides, steeper grades, and sharper curves, which also impedes the ability for emergency vehicles to respond.

Speed is a factor in the risks and severity of traffic accidents. Both the likelihood of accidents and the severity of injuries are greater with higher speeds. Communities are embracing initiatives for lowering speed limits such as the Vision Zero initiative that has been adopted by the City of Seattle and WSDOT's target zero initiative. Vision Zero initiatives make the goal of zero deaths and serious injuries the highest priority and emphasize government taking the lead to implement improvements to further that goal. An emphasis is placed on lowering speed limits, including engineering solutions such as narrowing traffic lanes, and employing traffic calming.

The City of Bainbridge embraces the principle of putting people first when it comes to safety over efficiency for vehicular traffic and even bicycle traffic. The City's standard roadway lane width is 10 feet providing narrow lanes for traffic calming. The following areas are emphasized for safe street design:

- Speed Limits – Consider neighborhood context and existing and future non-motorized use when establishing speed limits. For local access and minor collector streets, lowering speed limits can be an effective tool for obtaining lower speeds. For secondary arterials and major collectors, speed zones with lower speed limits can be an effective tool for lowering speeds. When traffic engineering professionals consider lowering the speed limit has potential for achieving lower speeds then the non-motorized safety aspects of the study should be heavily weighted in the analysis.

- In developing capital projects, consider elements that manage speed, improve safety and traffic calming. Examples include non-motorized improvements, roundabouts, traffic islands, and curb bulb outs, and radar feedback signs.

- Bicycle climbing lanes at locations where differential speeds are higher between cyclists and motorists;

- Pathways separated from the roadway for pedestrians, wheel chair users, and cyclists;
- Street lighting – Provide and maintain street lighting in areas used by pedestrians and cyclists in urban areas of the Island and near schools. Locations include intersections and mid-block crosswalks.
- Maintaining or providing vegetation for traffic calming close to the roadway.

In developing transportation improvement programs consider types of projects that provide improved safety for the traveling public, such as:

- Complete Streets,
- Shoulder Improvements,
- Separated Pathways, and
- Greenways.

The number of accidents provides an indication of the safety of an intersection. Types of safety concerns that may be contribute to accident data include:

- *Road Surface Conditions* – Poor roadway surface conditions such as pavement edge drop-offs, potholes, worn lane striping, and reductions in surface friction due to age and wear affect vehicle stopping and maneuvering capabilities. Road conditions may present hazards to cyclists and pedestrians.
- *Intersection Configuration* – Accidents related to high turning volumes, lack of channelization, and improper phasing.
- *Non-Motorized Conditions* – High accident data between vehicles with pedestrians or bicycles may emphasize the need for the construction of non-motorized facilities.
- *Geometric Conditions* – Accidents related to undesirable physical characteristics of the roadway's design, such as sight distance, curve radii, paved width and shoulder, and roadway slope.
- *Enforcement Issues* – Accidents related to vehicle speeding, intersection traffic violations, driving under the influence of alcohol or illegal drugs.

Accident History

Accidents can indicate where safety issues exist within a transportation system. The number of accidents at a specific location is a function of a number of factors including the quality of reporting data, traffic volumes, roadway design and geometrics, vehicle speed, and speed limit. For the analysis the total number of annual accidents at intersections over a ten year period is used. Unsignalized intersections with an average annual number of accidents of 5 or more is considered to be a high accident location. For signalized intersections 7 or more accidents is considered to be a high accident location.

City Intersections

Table 5-1 indicates intersection locations with 10 or more accidents over the ten year period ending in 2014 per the City's accident data base at locations other than along the SR305 corridor. Current data is compared with data from the previous study witch was reported over a 9.5 year period ending in 2000.

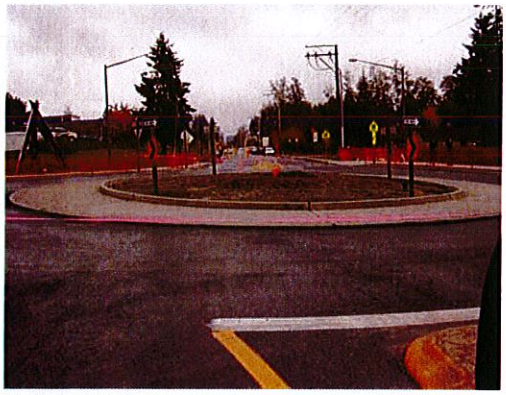


Table 5-1. Bainbridge Island Accident Locations

Intersection		Type	Accidents 2005- 2014	Average Annual Accidents	Accidents 1991 - 2000	Average Annual Accidents
High School Rd	@ Madison Ave.	RA	22	2.2	45	4.7
High School Rd	@ Hildebrand Lane	SC1	20	2.0	19	1.9
Winslow Way	@ Ericksen Ave.	SC2	14	1.4	18	1.8
Wyatt Way	@ Madison Ave.	SC4	13	1.3	23	2.4
Miller Rd.	@ Koura Rd.	SC2	12	1.2	---	---
High School Rd.	@ Grow Ave.	SC2	10	1.0	24	2.5
Eagle Harbor Dr.	@ Bucklin Hill Rd.	SC1	10	1.0	---	---

RA - Round About, SC – Stop Controlled

All of the top ten intersections fall below the high accident criteria threshold. The highest number of accidents is reported for the two intersections along High School Road west of and in closest proximity to SR305.

State Route 305 Intersections

The SR 305 highway is the State Highway's primary connection (via the WSF) between Seattle and the Kitsap Peninsula. Traffic during the morning and evening peak travel hours hascontinued to worsen resulting in long delays. This chapter reviews the issues associated with SR 305 and its impact to the City's roadway system. The chapter also describes a special study that was performed, and recommendations for future actions.

Summary of SR 305 Issues

SR 305 is significant to the City's roadway system as the major north-south travel corridor on the Island, not only for through traffic traveling to and from the ferry dock, but also for Island residents and employees. The goals and policies address the LOS standard, access to the Island via the Agate Pass Bridge, improvements to the highway, impacts to the highway from the City's Comprehensive Plan elements, and off-Island improvements that affect on-Island traffic.

As a state highway, WSDOT is the agency that is responsible for the operation and maintenance of SR 305. This means that WSDOT sets the minimum LOS standard and is responsible for the funding and implementation of any improvements to the highway. According to WSDOT policy, control of the highway within a City's corporate limits can be transferred to the City if itsit's population is greater than 22,500. According to US Census data, Bainbridge Island exceeded This population threshold in 2010 with a population of 23,025is expected to be exceeded on Bainbridge Island by the year 2008, according to US Census data. As a resultthe City's projections in the Comprehensive Plan. At that time, some of the responsibility for highway improvements could shift to the City, however, because SR 305 is a regional facility and is listed as a Highway of Statewide Significance, some responsibility could also remain with the WSDOT.

SR 305 LOS Impacts

The traffic analysis (described in Chapter 4) shows that current conditions on SR 305 do not meet the WSDOT minimum LOS standards, and future traffic will be even worse. Currently, along the SR305 Corridor all collector street intersections fail and one secondary arterial intersection (Koura Rd.) do not meet level of service standards. The PM peak hour average speed along the seven-mile corridor is currently 16 miles per hour, with several roadway segments operating below the average speed. The problem is most severe at the north end of the study area, where there are large back-ups beginning at the Suquamish Way intersection and Agate

~~Pass Bridge. By 2021, all of these locations will have failed LOS. Additionally, by 2035 the Day Road intersection will be LOS D and approaching falling below standard. The corridor is forecasted to operate with an average speed of 14 mph by 2035, which is less than one-third the posted 45 mph speed limit at the north end of the Island. The expected level of service for the highway without improvement – described as the No Action alternative – are shown for the 2015, 2021, and 2035 years in Figures 5-1, 5-2, and 5-3.~~

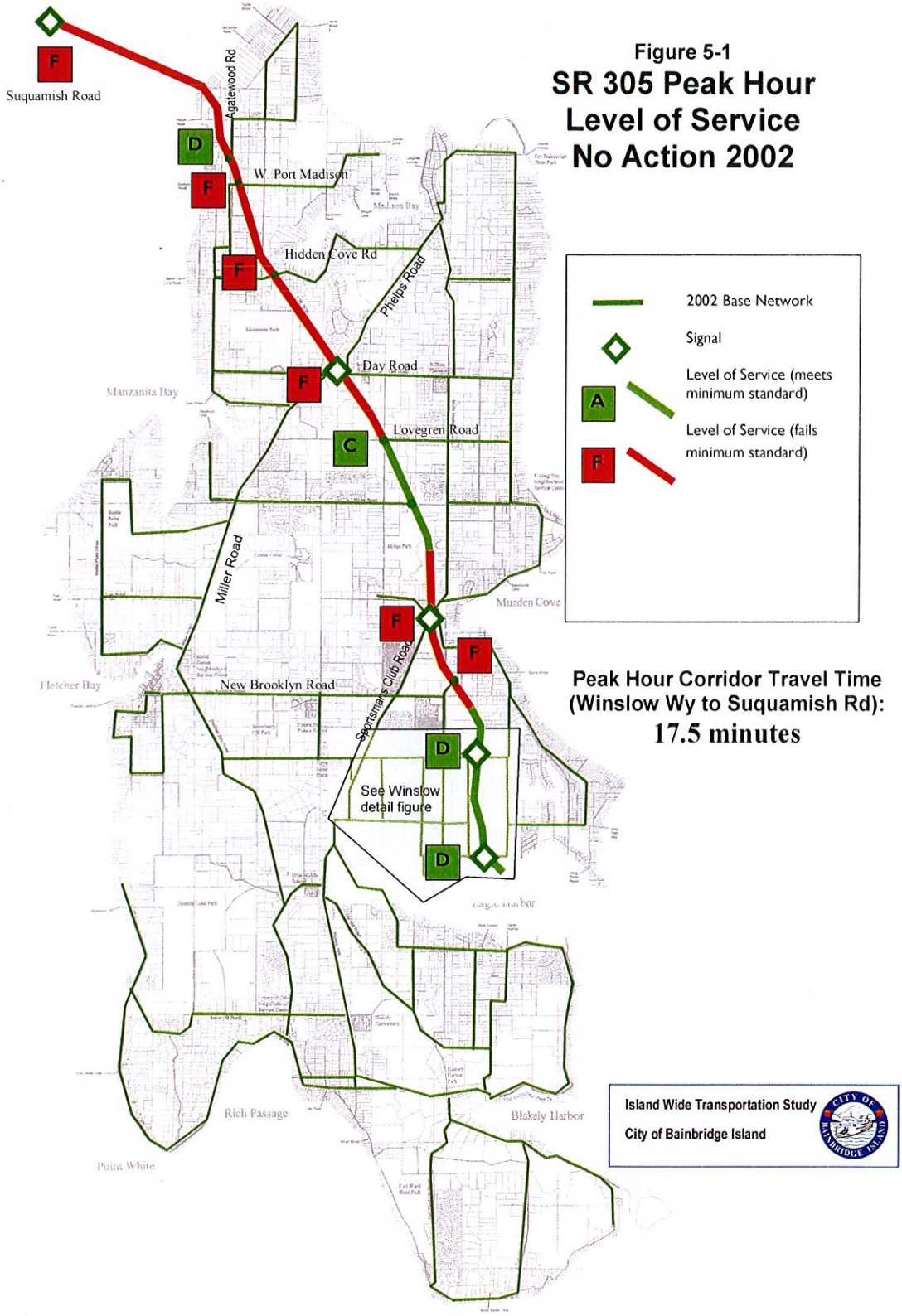
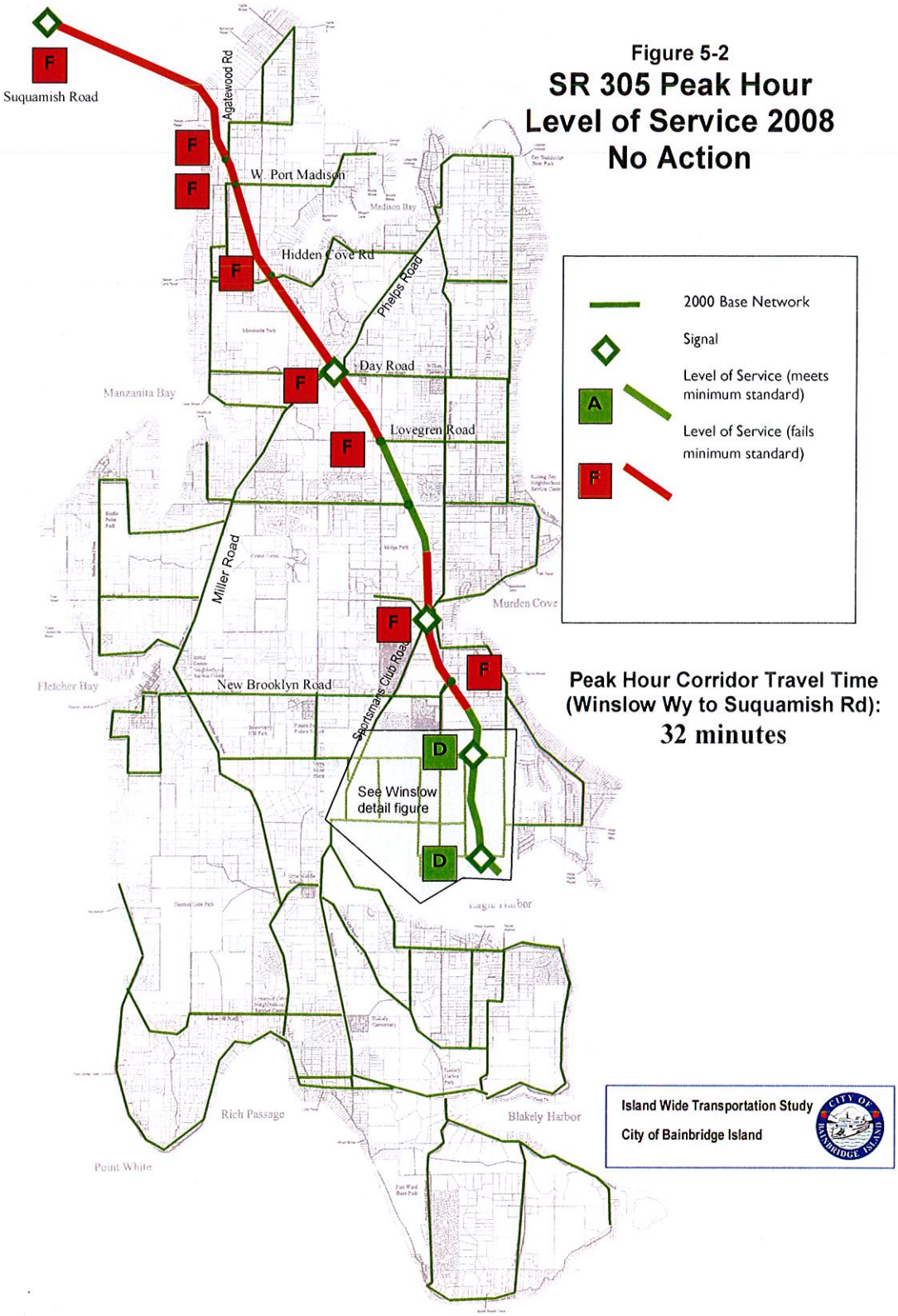


Figure 5-1
SR 305 Peak Hour Level of Service No Action 2002
Suquamish Road
Agatewood Rd
W. Port Madison
Madison Bay
Hidden Cove Rd
Phelps Road
Day Road
Manzanita Bay
Lovegren Road
Miller Road
Murden Cove
Fletcher Bay
New Brooklyn Road
Sportsmans Club Road
See Winslow detail figure
Eagle Harbor
Rich Passage
Blakely Harbor
Point White
2002 Base Network
Signal
Level of Service (meets minimum standard)
Level of Service (fails minimum standard)
A
F
C
D
Peak Hour Corridor Travel Time (Winslow Wy to Suquamish Rd):
17.5 minutes
Island Wide Transportation Study
City of Bainbridge Island

Figure 5-2

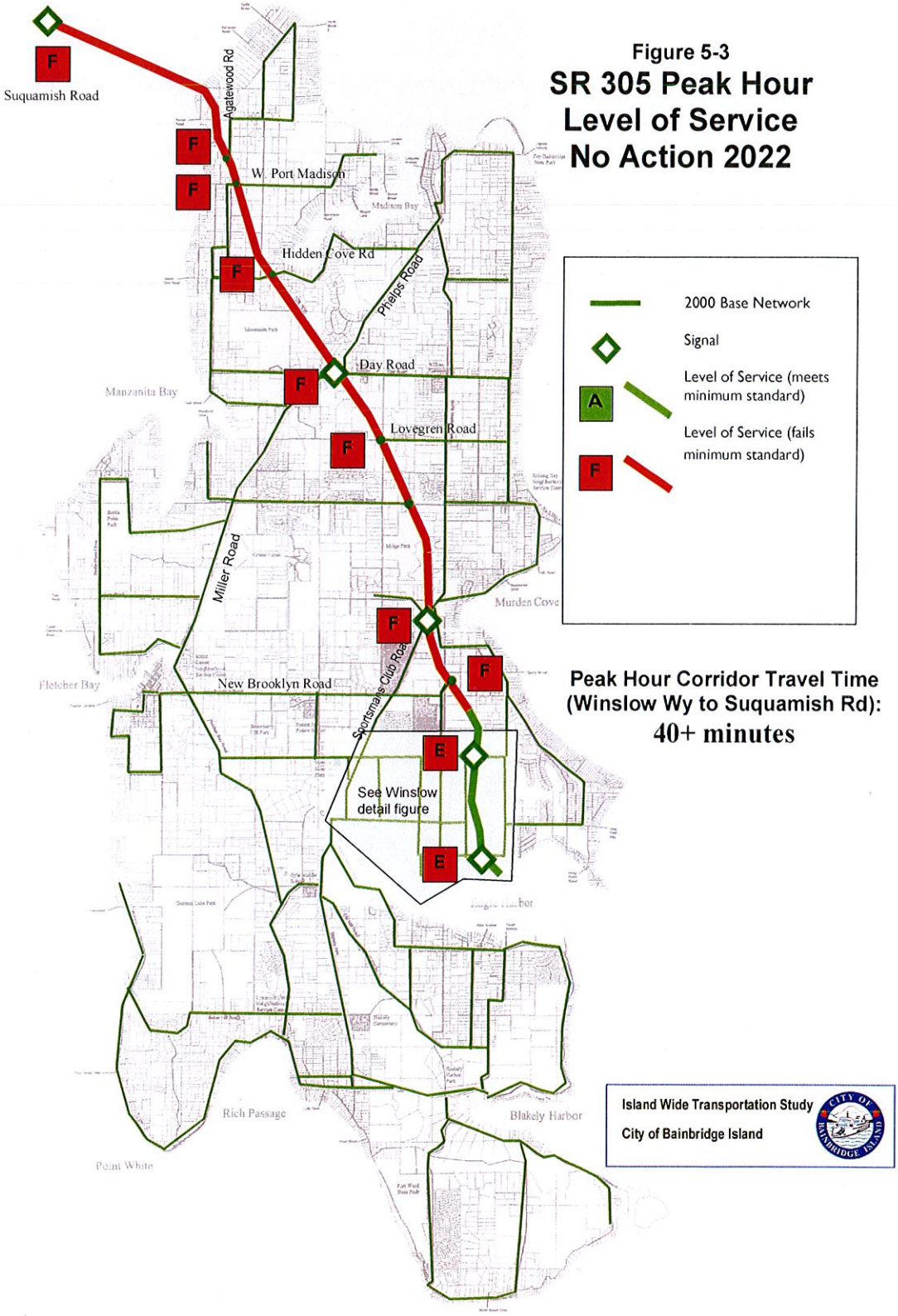
SR 305 Peak Hour Level of Service 2008 No Action



Peak Hour Corridor Travel Time (Winslow Wy to Suquamish Rd):
32 minutes

Island Wide Transportation Study
City of Bainbridge Island

Figure 5-3
SR 305 Peak Hour Level of Service No Action 2022



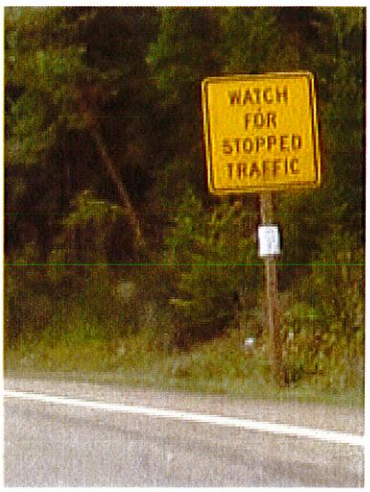
~~*What Makes SR 305 Different?*~~

The traffic issues on SR 305 are different than the issues associated with the rest of the Island's roadway system for several reasons. First, the highway facility is owned and operated by the WSDOT. This is significant because WSDOT would be the lead agency and would have primary decision-making and financial responsibility for improvements to the highway. Second, even though the highway functions as a main north-south corridor for Island travel, it is also heavily used by regional traffic and is a Highway of Statewide Significance, especially by vehicles traveling to and from the ferry terminal in Winslow. Because the WSF controls the ferry schedule, they have a great deal of influence on when and how much ferry traffic is using the highway. Third, the highway experiences substandard levels of service over most of the seven-mile length of the highway on the Island and the Agate Pass bridge. Improvements to the highway would require several large projects that could be expected to require significant time to complete the planning, design, and construction of each, and a significant financial outlay.

This Plan updates the 2004 Island-Wide Transportation Study. The 2004 Study forecasted significant traffic growth on SR 305 which has not occurred as anticipated. This study updates the SR 305 travel demand and level of service forecasts using the planning and operational models described in Chapter 4 of this Plan, which yielded a more modest growth forecast than described in the 2004 Study. The updated Plan studied the roadway network on the Island, which does not include the intersection of SR 305 and Suquamish Way to the north of the Agate Pass Bridge. It is understood that short- and long-term improvements along SR 305 must consider the SR 305 corridor as a whole and that congestion at Suquamish Way could impact operations on the Bainbridge Island roadway network.

SR 305 Special Study

Because of the major issues associated with SR 305 improvements, a preliminary study was undertaken to determine what kind of possible improvements could resolve the traffic issues without looking into the environmental, financial, or other issues associated with the improvements. The goal of the study was to identify possible improvements along the SR305 to compare their effectiveness to improve mobility along the corridor, improve permeability across the corridor, and provide reliable access to neighborhoods whose only access is from SR305. Based on this information, the NMTAC and Staff, could include recommendations in the IWTP to better position the City to advocate for improvements.



Because SR 305 is a state facility, all improvements would require a commitment by WSDOT to be constructed. The City could participate in the improvements in order to improve mobility and level of service for the City roadway system.

Special Study Alternatives

Two preliminary alternatives were developed to examine different future scenarios to see if there is a way to overcome the SR 305 operational deficiencies.

The first alternative, Alternative A, represents the scenario with all crossings at grade and improved and additional signalized intersections. Limited access is included at north Island locations. Refer to Figure 5-4.

This concept includes:

- Access from both sides of the highway from Reitan Rd.
- Frontage road serving Agate Beach Ln. and Agatewood Dr.
- Signals at Agatewood Dr. and West Port Madison Rd. w/ combined operation.
- Widening of the signalized intersection at Day Rd. to add two lanes at the north and south legsovercoming the barrier that the congested highway becomes and generally crossing or improving parallel routes connecting to , allowing the highway to continue to function as part of the Island's roadway system of the intersection.
- Widening of the signalized intersection at Sportsman's Club Rd to add two lanes at the north and south legs of the intersection.

Signals are spaced from the SR305 Sportsman's Club Road intersection north at a regular spacing such that signals can be timed to minimize travel times along SR305. In this scenario, funding is prioritized to ensure that most Island locations have reliable access to SR305. The State envisions a roundabout at Suquamish Way to be one viable long term alternative. If constructed, limited access between the roundabout and the first traffic signal on the Island would be needed as there would be no control of traffic flow at peak hours. The SR305 intersections at Hidden Cove Rd, Lovegreen Road, and Koura Road would fail during the PM peak hour. The traveling public at these times could choose to access SR305 at other signalized intersections at peak hours in most cases.

The second alternative, Alternative B, represents a scenario that incorporates a reversible transit and car pool lane and separated grade crossings. Limited access is included for the entire corridor. Refer to figure 5-5.

This concept includes:

- Access from both sides of the highway from Reitan Rd.
- Frontage road serving Agate Beach Ln. and Agatewood Dr.
- Overpass of SR305 at Agatewood Dr. w/ no access to SR305
- Interchange underpass of SR305 at West Port Madison Rd.
- Underpass of SR305 at Hidden Cove Rd w/ no access to SR305
- Interchange overpass of SR305 at Day Road and reconfiguration of Phelps road approach.
- Interchange w/ underpass of SR305 at Sportsman's Club Road and abandonment of Moran Road access to N. Madison Ave.

The State envisions a roundabout at Suquamish Way to be one viable long term alternative. If constructed, limited access between would be needed on the north end of the Island south of the roundabout as there would be no control of traffic flow at peak hours. The SR305 intersections at Lovegreen Road and Koura road would fail during the PM peak hour. The traveling public at these times could choose to access SR305 at other intersections at peak hours in most cases. While not included in this Plan, an underpass of SR305 could be added at Koura Rd. Alternative connectivity for other local access roadways serving smaller neighborhoods with their only access at SR305 could also be studied.

Using a modified Highway Capacity Manual-based arterial roadway capacity calculation methodology and the roadway level of service standards described in Chapter 4, roadway level of service failures would persist along most of the SR305 corridor under both alternatives described in this Plan.

Special Study Results and recommendations for further study

The two improvement alternatives were analyzed and compared to see how well they were able to meet LOS minimum standards. The special study compares at-grade and separated grade alternatives. In each alternative, the number of intersections was minimized while providing for reliable access to most Island locations. LOS C or better is maintained at most intersections for both alternatives. With alternative B, an LOS B or better is achieved for most intersections north of the urban center of Winslow. However, in some locations alternative longer routes would need to be taken to access intersections meeting LOS standards. Additional intersection improvements could be evaluated in a more comprehensive plan. Roadway level of service failures are not mitigated in either of the two alternatives but would require additional roadway capacity along the SR305 corridor (e.g. in the form of added travel lanes) or decreased volume. Note that it is assumed in the analysis that the SR305 intersection at Suquamish Way will be improved so as not to have a ripple effect on Island intersection locations.

Further study is needed to design alignments and develop reliable cost estimates to adequately plan for maintaining adequate level of service both currently and in the next 20 years along SR 305. Grade separated alternatives would be significantly more costly to implement than at grade alternatives. Both alternatives achieve acceptable LOS. Therefore, it may be difficult to justify the additional cost of grade-separated alternatives, especially larger interchanges. Some combination of intersection improvements and limited access is needed to reduce congestion and provide for reliable access. It may be practical to incorporate less extensive grade separation options for both motorized and/or non- motorized modes to maintain permeability along the corridor.

The SR305 corridor as it exists today and with any future improvements will have a significant impact on many aspects of transportation on Bainbridge Island. Further study should be inclusive of and comprehensive to address all aspects. The following issues have been identified for inclusion in further study of the corridor:

- Operations of adjoining roadway networks and connectivity – The study should consider the effectiveness of the adjacent roadway networks along the corridor. There may be opportunities to mitigate cut through traffic and improve connectivity. There may be impacts to circulation and neighborhoods.
- Corridor Permeability – The 2004 IWTS included a special study that looked at two improvement scenarios. The first scenario, Alternative A, assumed increasing congestion would not be mitigated and interchanges and crossings to restore east-west travel along the corridor. Permeability for all modes remains a key consideration for any scenario.
- Maintaining reliable access for neighborhood – For many neighborhoods, such as in the Agate Pass and West Port Madison areas, the only access is from roadways that connect to SR305. Maintaining reliable access is an important aspect of any scenario.
- Sound to Olympics Trail and Inter-Island Trails – The City envisions a network of regional and sub-regional separated pathways along and crossing the SR305 corridor. The existing and potentially wider highway presents a barrier to many users. Permeability for active modes of transportation is a key consideration for intersection and other improvements.
- Bus Transit – Improving efficiency of and access to transit along the corridor is an important aspect that should be studied and integrated into all scenarios. Collaboration with Kitsap Transit is needed to explore possibilities.

, allowing residents to cross the highway and maintain mobility on the City's roadway system, and drivers would be able to use the highway as part of the roadway system

Results of the survey from the Open House indicate that there is community support

Figure 5-4
SR 305 Alternative A
Level of Service 2022

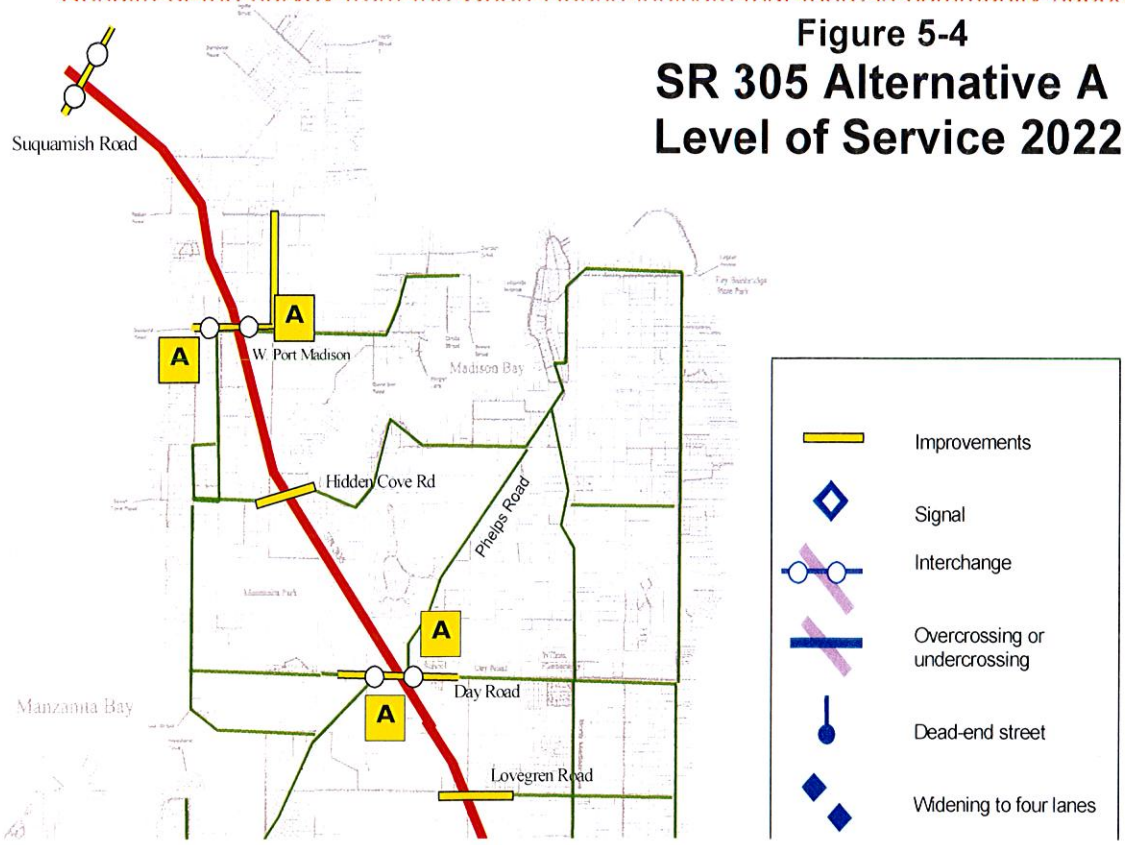
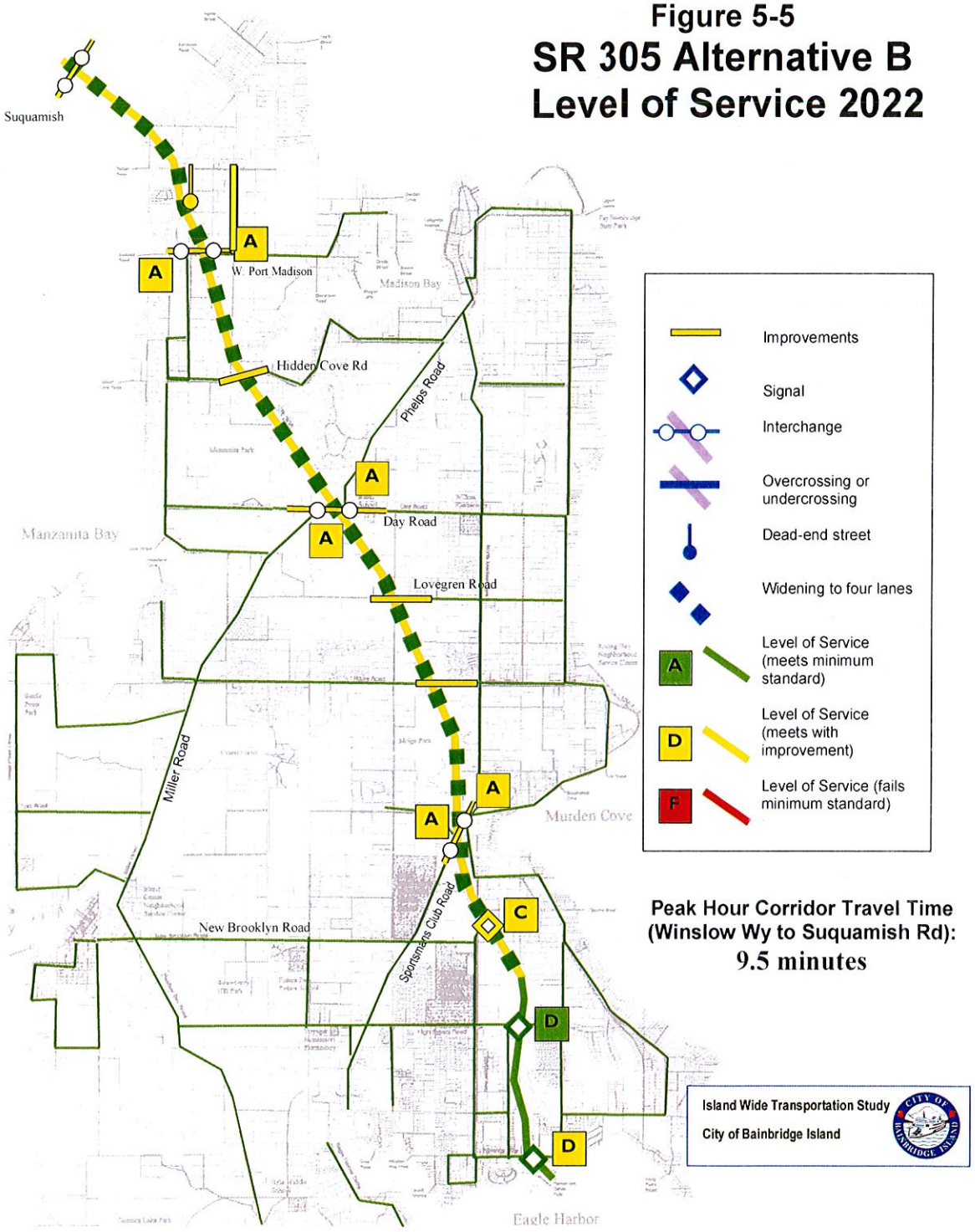


Figure 5-5
SR 305 Alternative B Level of Service 2022



Other SR 305 Issues

The deficient level of service is the most significant issue currently affecting the City's transportation system. The bridge, park and ride, and off-Island improvement issues will be addressed in future studies in conjunction with an overall plan for SR 305 improvements. The City should take a leadership role in initiating studies to develop improvement projects and not defer to WSDOT's timeline and priorities. The City should partner with Kitsap Transit and others to reduce vehicular demand on the Highway.

SR 305 Recommendations

Since the 2004 IWTS, WSDOT has implemented a number of intersection projects including the following:

- Signal improvements at N. Madison.

Signal timing optimization for peak hour ferry offloading at the Winslow Way intersection

- Signal timing optimization for the Day road intersection to improve access from Day and Miller.
- Bike through lane on right improvements to the north and south legs of the intersections at Madison, Sportsman's Club/ N. Madison, and Day Roads.

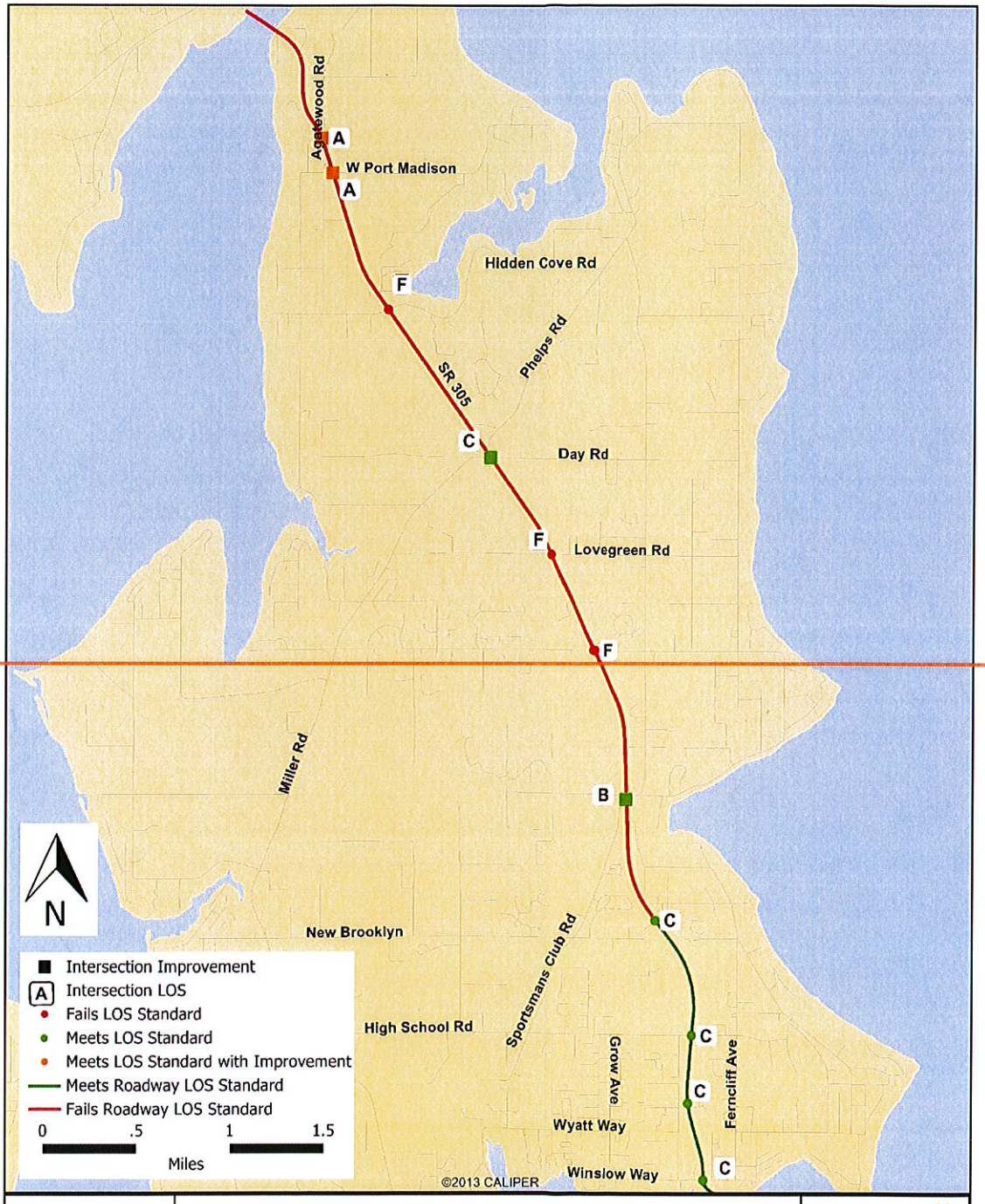


Figure 5-4
SR 305 Level of Service
2035 Alternative A

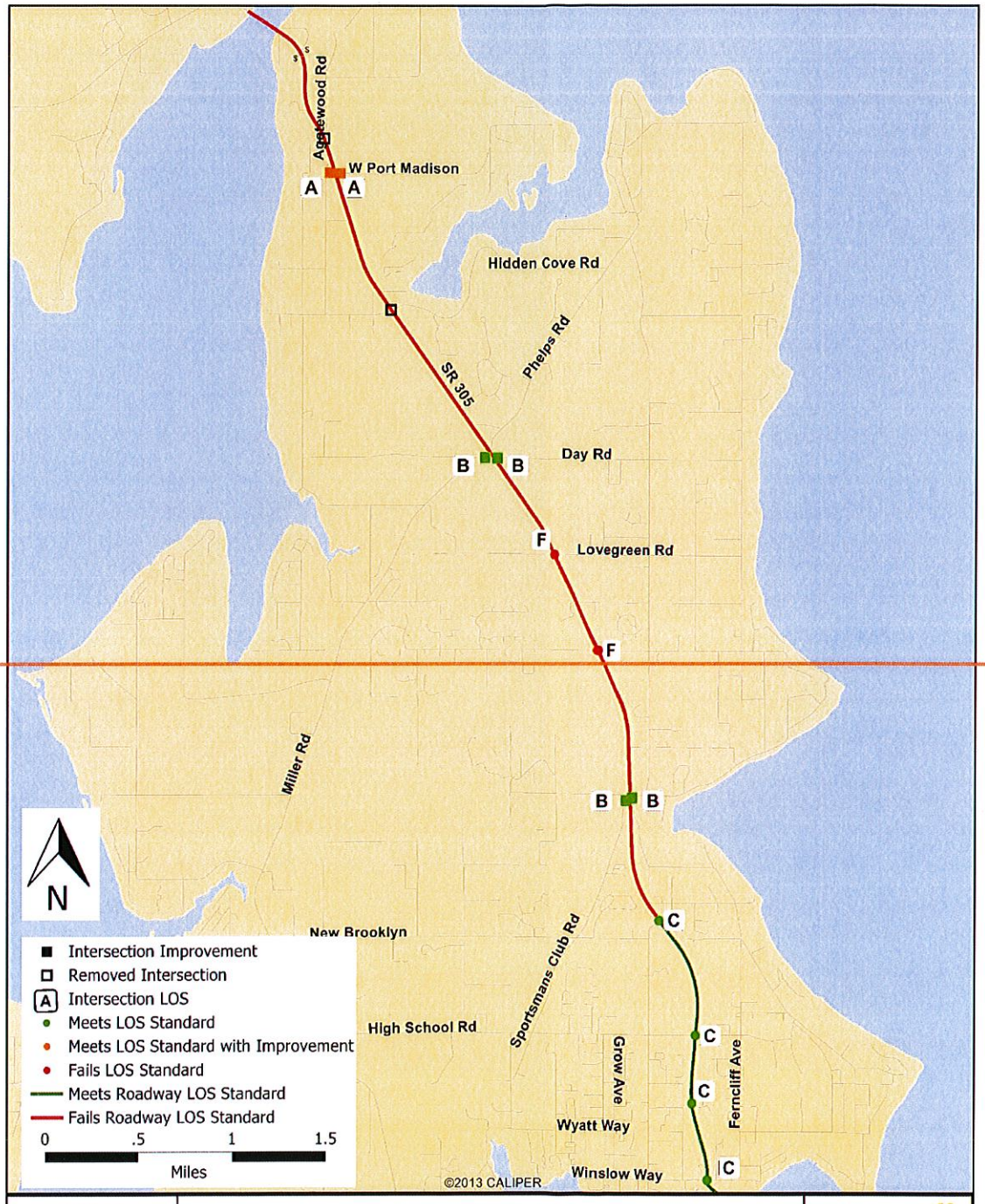


Figure 5-5
SR 305 Level of Service
2035 Alternative B

A number of interim and long term recommendations are as follows based on the special Study.

Interim Improvements:

The following interim improvements are recommended at the time of this Report for the next 6 years:

- Support WSDOT's proposed right hand turn lane at the south leg of the Suquamish Intersection, including bicycle lane, and pedestrian sidewalk and crossing improvements.
- Advocate for WSDOT to include "do not block" intersection signage at intersections north of Day Road, Hidden Cove, West Port Madison, and Agate Point in the above WSDOT project.
- Intersection improvements at West Port Madison eliminating access to Seabold and providing a receiving lane (similar to Agate Pass) for south bound traffic.
- Advocate for consistent 8 foot or wider paved shoulders along the full length of the corridor to accommodate cyclists and pedestrians.
- Advocate for the Sound to Olympics Trail and its branch trails.
- Advocate for improved access to ferry and bus transit including park and ride and bike parking opportunities both on and off island.
- The proposed West Port Madison Intersection project should be scoped and evaluated for inclusion in the City's Capital Improvement Plan.

Long Term Recommendations:

The following Long Term specific improvement projects are recommended:

- Advocate for improvements at the intersection to Suquamish to address north south mobility/capacity. Advocate for the bi-direction transit lane recommended in the 2006 Multi-modal plan.
- Advocate for Agate Pass Bridge replacement/ renovation.
- Advocate for a separated pathway for non-motorized users in conjunction with the bridge replacement.
- Advocate for limited access improvements at Reitan in conjunction with the bridge replacement. This would include access for Reitan and possibly connection frontage roads from both sides of the highway in conjunction with the bridge replacement.
- Advocate for a joint signal at Agate Point & West Port Madison to restore access to these "highway locked" areas.
- Advocate for channelization and signal improvements to accommodate additional north-south queuing capacity (4 lanes) at the Day Road Intersection.
- Advocate for a right hand turn lane at the west leg of the Madison intersection. Note that intersection improvement at New Brooklyn should also be considered at that time.
- Advocate for capacity improvements to roadway segments north of the Madison Avenue intersection. Alternatives may include HOV lanes, a reversible HOV

~~lane, or shoulder use by HOV's. Improvements should be design to accommodate bus rapid transit.~~

~~The above improvements should be evaluated in studies undertaken by the City or other agencies.~~

~~If and when the State legislature resolves its transportation funding challenges, the City could then re-evaluate opportunities to partner with WSDOT Olympic Region, Washington State Ferries, Kitsap Transit, and other local agencies to invest in planning/permitting (EIS) for the implementation of a large scale multi-modal regional transportation improvements to the SR305 Corridor. Until that time, the long term project improvements identified in the Plan recommendations will serve as policy guidance for the City and City recommendations for WSDOT and other jurisdictions. , with the City taking the lead role rather than waiting until the highway becomes a priority for WSDOT studyand in addition to or in conjunction with improvements recommended in Chapter 4 for SR 305The committee recognizes that the Island portion of SR 305 can not be effectively studied without looking at the rest of the corridor up its junction with SR 3. Also, the committee feels that this study should build upon and use relevant previous studies that have been done for the corridor.~~

Table 5-2 indicates the accident rates at primary intersections along the SR 305 corridor as from data available from the Washington State for the ten year period ending in 2014. The number of reported accidents, and the average annual rate over a 3.25-year period from the prior IWTS. Annual average accidents are shown for comparison purposes Department of Transportation. The table displays the intersection cross streets, the type of intersection ("S" signalized, "U" un-signalized),

Table 5-2. SR 305 Accident Locations

Intersection		Signalized/ Unsignalized	Accidents 2005 - 2014	Average Annual Accidents	Accidents 1997 - 2000	Average Annual Accidents
SR 305	@ Madison Ave.	S	82	8.2	22	6.8
SR 305	@ Sportsman's Club Rd.	S	71	7.1	21	6.5
SR 305	@ Day Rd.	S	52	5.2	34	10.5
SR 305	@ High School Rd.	S	47	4.7	25	7.7
SR 305	@ Winslow Way	S	31	3.1	9	2.8

Under 23 U.S. Code § 409, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying , evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for

damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data

As indicated by the table, the intersections at SR 305/Madison and SR 305/Sportsman's Club exceed 7 accidents per year which is considered higher than what is normally expected for signalized intersections. There are no scheduled improvements identified by WSDOT for these intersections.

Accidents involving pedestrian and cyclists

From review of the State accident report there were 19 injury accidents reported involving pedestrians (6) and cyclists (13) along the SR305 corridor for the ten year period. The highest concentration of accidents was near the Ferry Terminal. The vast majority of these accidents outside of the urban Winslow area involved cyclists. A project for implementing non-motorized improvements on SR305/ Olympic Drive near the Ferry Terminal is in progress.

From review of City accident reports outside of SR305 there were 121 injury accidents reported involving pedestrians (27) and cyclists (94) for the ten year period. There was at least one fatality involving a pedestrian on struck crossing the street on New Brooklyn in December of 2010. The highest concentration of accidents occurred on Madison Avenue (17), Winslow Way (16), High School Road (14), and Wyatt Way (10). In 2012 Winslow Way was reconstructed including pedestrian and bike facility improvements. Non- motorized improvements are planned for Wyatt Way and Madison Avenue.

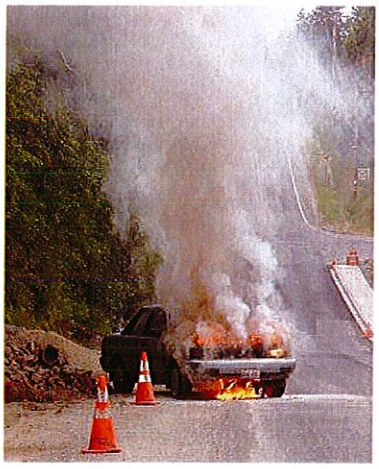
Addressing Safety Problems

Addressing safety problems require a combination of approaches ranging from educating the driver, enforcement, to improving the roadway. Roadway improvements fall into two major categories — improvements designed to prevent crashes from occurring, and improvements that minimize the severity of crashes that occur. Types of improvements that can improve safety problems include:

- *Clear Zones*—Areas of open space with gentle slopes adjacent to the road giving motorists room to safely regain control of their vehicles if they run off the road. These areas should include features such as signs and utility poles which breakaway on impact, barrier walls or guardrails that redirect vehicles away from hazards, and crash cushions that absorb energy and lessen the severity of crashes where appropriate.
- *Guardrails* – The Island along its perimeter has many medium and high bluffs. In the interior the island's topography is hilly in many areas. Guardrails are employed at many locations. Many of these guardrails are older not meeting current design standards and some are in disrepair. There are some locations where new guardrails may be warranted due to roadway configuration, topography, traveled speed, and traffic volumes.
- *Signing, Pavement Marking, and Delineation* — Traffic signs, pavement markings, rumble strips, and reflective devices improve driver perception of important

roadway features and alert them to changes in roadway geometry or other conditions.

- *Pavement Improvements and Preventive Maintenance* — Greater smoothness and friction of the road surface are provided by pothole repair, resurfacing, rehabilitation, and reconstruction.
- *Intersection Controls* – Stop signs, roundabouts, and traffic signals can better control traffic flow and reduce intersection conflict points.
- *Adding or Widening Shoulders* – Shoulders provide drivers, pedestrians, and cyclists with additional room to maneuver on narrow roads or to pull out of travel lanes.
- *Channelization* – Separate lanes for left or right-turning traffic avoid impediments to traffic flow, which can lead to rear end crashes.
- *Pedestrian/Cyclist Facilities*—A variety of techniques can be used to separate pedestrians and cyclists from motor vehicle traffic to improve safety.



How study addresses safety

The IWTP proposes improvements that will improve the safety of the roadway system through targeted improvements at intersections and roadways. Safety-related elements of this study include:

- Reviewing roadway geometrics and promoting safety enhancements,
- Identifying and mitigating of high accident locations,
- Identifying and mitigation of intersections with poor LOS operations, and
- Including safety as a factor in the evaluation of the roadway system.

Safety Programs

- Roadside Safety Program – This program provides for the inventorying and inspection of roadside elements of the Island's secondary arterial streets and higher volume collector streets. The program also provides for contracting work that is beyond the capacity of Operations and Maintenance. Roadside elements include items such as guardrails, shoulders, and clear zones. This program provides for the prioritization of guardrail repairs, replacements, and installations.

- Focused Traffic Studies Program – This program provides for the study of traffic control measures implemented on the Island's roadways. As conditions change with factors such as population growth and development, it is necessary to evaluate the effectiveness of roadway signage and other traffic control devices. Many residents are concerned about vehicular speeds and this program provides for the evaluation of speed limits.

Maintenance

An increasingly important function of the City of Bainbridge Island is preservation and maintenance of the existing roadway system. Careful maintenance allows existing travel corridors to keep their function, prevents damage from water and vehicle loads, and maximizes the use of City resources.

Maintenance Issues

The City of Bainbridge Island's Public Works Department is in charge of roadway maintenance activities for the Island.

Key maintenance issues for the City include:

- *Vegetation growth* – Overgrown vegetation requires the trimming of foliage to retain roadway safety and sight distance.
- *Pavement maintenance* – As roadways age, the pavement surface and underlayment can be damaged by traffic, heavy vehicles, weather, and water seepage if not property maintained. Poor pavement condition can also affect the safety of the road for drivers and bicyclists.
- *Gravel road grading* – The surface of gravel roadways can deteriorate fairly quickly, producing potholes in the roads. These roads need regular re-grading to maintain the surface.
- *Dirt and gravel on shoulders and roadways* – Regular sweeping of roadways is necessary to provide a clean, smooth surface for drivers. Bicyclists are particularly concerned about gravel, dirt and debris accumulating on shoulder areas.
- *Stormwater* – Maintaining good roadway stormwater drainage is important to protect the roadway and to prevent flooding hazard.
- *Roadway erosion* – Roadway erosion on shoreline and steep slope areas is increasingly becoming an issue for the City. Repair of these roadways often is expensive and may require special permits and consistency with shoreline management goals and objectives.

Maintenance Programs

The roadway system has a number of on-going needs to keep the current roadway system functioning, and to prevent major roadway failures that would require extensive roadway reconstruction. The City Public Works Department's operation and maintenance program has the primary responsibility for these programs.

- *Street sweeping program* – Island-wide, street sweepers collect debris and litter before they enter the stormwater collection systems or roadside ditches. This function is important to protect stormwater run-off from the roadways and to provide a safe surface for automobiles and bicyclists.
- Brush cutting program – Island-wide mowing of vegetation to maintain roadway clearance and sight lines.

- *Roadway ditches and shoulders* – These components of the roadway system are periodically maintained, cleaned, and reshaped to ensure they function as designed.
- *Roads preservation program* – The City of Bainbridge Island has an annual road program focused on preserving, maintaining, and repairing the existing roadway infrastructure. The April 11, 2001 Pavement Management Program evaluated 462 street segments totaling 256 lane miles in length. The study recommended a strategy for each of the streets evaluated for either 1) reconstruction, 2) overlay, 3) seal coat and/or 4) patching. Where the roadway does not require complete reconstruction the City can repair damaged sections (patch with asphalt), apply chip seal layer (an oil emulsion and crush rock layer), or overlay new asphalt over the existing pavement.
- *Gravel grading program* – The City fills and regrades the surface of the gravel roads in the system annually.
- *Trail and Pathway Maintenance program* – The City cuts brush and restores trail surfaces to maintain its separated pathway and trail network.
- *Special Maintenance* – The City also performs maintenance activities not addressed in the above programs such as the removal of large trees that may present hazards to the traveling public.
- *Sign Inventory* – The City maintains a data base of signage and routinely maintains or replaces signs to meet reflectivity and other requirements.

How study addresses maintenance

The IWTS proposes improvements that will address roadway maintenance and promote the long-term preservation and operation of the street system. Maintenance related elements of this Study include:

- Establishing the use of existing City transportation facilities as key elements of the future travel network. The need to maintain and improve these facilities is required to meet City roadway standards
- Promoting maintenance as a priority need in the budgeting and financing of transportation functions.
- Identifying roadway improvements that meet the minimum requirements of the City's Design and Construction Standards and Specifications.